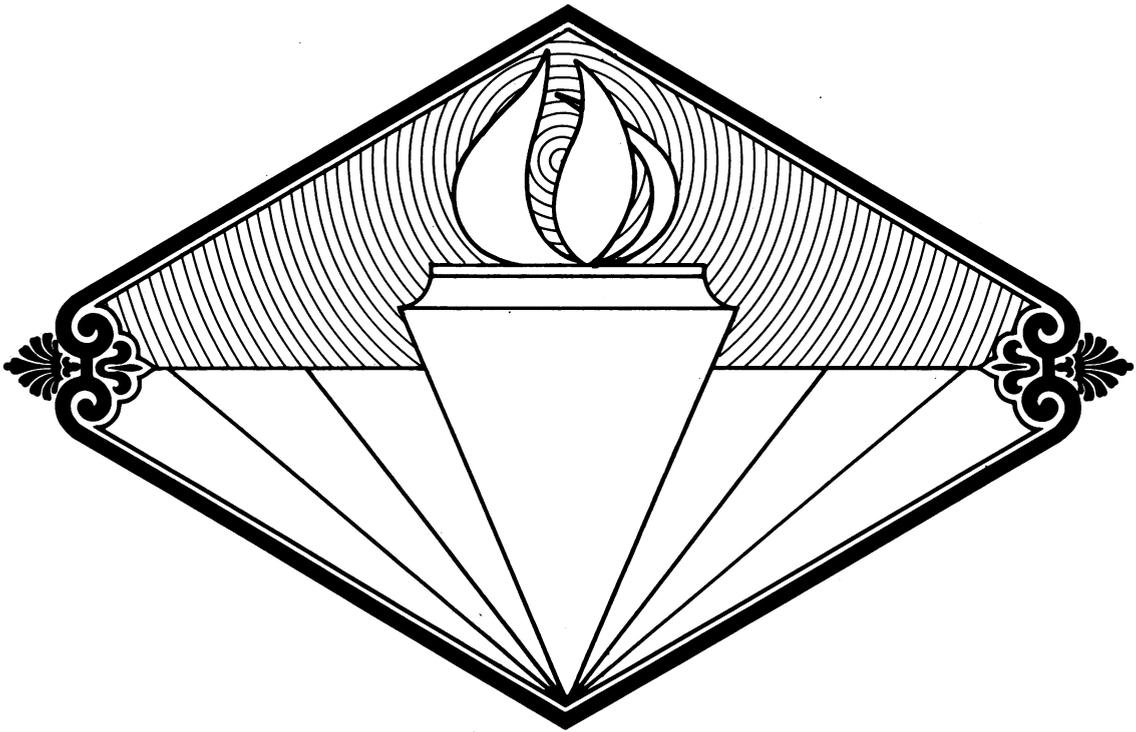

Health Manpower for Rural Primary Care

Problems and potentials in relating medical education to rural needs, as illustrated by recent attempts in Wyoming and in Central Africa



STEPHEN C. JOSEPH, MD, MPH

THE AVAILABILITY AND DISTRIBUTION of primary care and basic health services are of increasing worldwide concern. Access to minimal services is a particular problem in the rural areas of the world, where approximately three-quarters of the population lives. In addition to the local problems posed by scarcity of human services, including health, the "service isolation" of rural communities probably remains a significant factor in the major rural-to-urban migrations that have been taking place in both the affluent and the poorer nations over the past three centuries.

With regard to health services, in the past little emphasis was placed on effectively meeting the health care needs of the rural periphery. The consequent imbalances

of distribution are familiar to us in the United States; they are even more sharply reflected in most developing countries. Recently, however, in many societies—including ours—interest has heightened in fostering a wider distribution of rural health services to the extent that resources are available to provide them. There are some

□ *This paper is adapted from one presented by Dr. Joseph at a scientific colloquium of the Health Resources Administration, Rockville, Md., January 10, 1975. Tear-sheet requests to Stephen C. Joseph, MD, Director, Office of International Health, Harvard University School of Public Health, 677 Huntington Ave., Boston, Mass. 02115.*

interesting parallels between efforts to provide rural health services in the United States and in developing countries. One set of these parallels is described briefly in this paper.

In addition to the organization and financing of health services, the difficulties entailed in the training and distribution of appropriate health care personnel—appropriate in the sense of orientation and competence relevant to the needs of a particular area—are especially acute for rural areas. Low-density populations; logistic obstacles posed by geography and climate; and lack of personal and professional incentives for living in rural areas, especially for physicians, accentuate the difficulties of providing adequate numbers of qualified personnel.

Approaches to Rural Health Care

Although no government or institution can claim to have solved the rural health issue and while local efforts vary significantly from country to country, there are two major current approaches toward a solution. One approach is the development of local health systems that depend on nonphysicians to provide the major part of primary health care. This approach is especially useful in areas where manpower and financial resources preclude or severely restrict the availability of physicians (1). The second approach is the development of a team framework in which various types of health workers, including physicians, interact in a mutually supportive manner to maximize efficiency and effectiveness and to extend the reach of services (2). This approach would apply where adequate resources are available or where the presence of a physician is necessary, or both. The health care team is the manpower analog of the administrative “regionalization of health services” described by Grant 30 years ago (3).

A number of illustrations of the use of these two approaches—nonphysician primary care workers and development of health teams that include physicians—appear in the literature: China (4), Iran (5), Ghana (6), Colombia (7), as well as the United States—MEDEX (8), nurse practitioners (9), and the health team as developed by Wise (10). The two approaches have at least one important element in common; that is, if physicians are to be engaged directly or indirectly in the planning, organization, or delivery of health services, they must be motivated and trained quite differently than they have been in the past (11).

A major obstacle to more rapid spread of the two approaches, in the United States and in the developing countries, is that traditional systems of medical education are not congruent with either the objectives or the methods that are required to achieve a broader distribution of rural health services provided by health teams which include nonphysicians as primary care providers. Not only are the institutions that educate physicians ill equipped to provide appropriate education and training, but also the products of these institutions have internalized sets of professional and personal skills and attitudes

that make it difficult for them to be responsive to, or supportive of, appropriate training for either direct or indirect provision of basic health services in rural areas.

Since medical schools and their physician products wield considerable influence in determining the local patterns of reorganizing and delivering health services, how can institutional and curriculum patterns be modified to meet the needs of resource-scarce rural areas? This question is particularly important for developing countries that have high morbidity and mortality rates, scarce fiscal and manpower resources, and predominantly rural populations. While it is a more marginal concern for countries such as the United States, the question also has important implications for urban and suburban, as well as rural, health care delivery systems.

The following are two illustrations of attempts to modify medical education toward a more equitable distribution of rural health services. The first illustration concerns planning for a new educational institution in Wyoming, and the second concerns a specific teaching model developed for use at a new school in Central Africa. Both illustrations provide a view of some potentials and problems in attempts to relate contemporary medical education to the health care needs of rural communities.

Wyoming

With a population of 360,000 in 100,000 square miles, Wyoming has only 2 “cities” (Casper and Cheyenne) with populations of 50,000 to 60,000 and only 3 counties that contain 20,000 to 30,000 people. The remaining 18 counties contain almost half of the State’s population; in these counties, people live in small towns, villages, and on farms and ranches that are generally separated by large distances.

The approximately 330 physicians in Wyoming provide a physician-to-population ratio that is 62 percent of the national average. In the more rural areas of the State the ratio is even smaller, and in these areas the physicians tend to be older general practitioners who are seldom replaced—when they die or retire—by younger practitioners. The changes in physician-to-population ratios from 1953 to 1973 for the overall United States and for Wyoming are shown in the table.

The medical demography of the State shows a pattern of solo practice with a predominant distribution of general practitioners in the smaller towns and of specialists in the few areas of population concentration. In recent years, the trends have been toward in-migration of younger, specialty-trained physicians to the larger towns and more urban areas.

Wyoming has only one 4-year college; it has never had a medical school. In 1973, the Wyoming Legislature appropriated funds for the preparation of a detailed proposal for medical education (12,13) because of the following concerns: (a) growing awareness of the inadequacy of physician and primary care availability and accessibility and that this situation was worsening, (b)

Changes in population and physician-to-population ratios in Wyoming and overall United States, 1953-73

United States and Wyoming	Population in thousands		Percent change in population, 1953-73	Physicians per 1,000 population			
	1953	1973		1953		1973	
				Number	Percent ¹	Number	Percent ¹
United States, overall	159,253	211,096	+33	1.42	100	1.69	100
Wyoming, overall	295	355	+20	0.88	62	1.06	62
Average of all Wyoming counties with—							
Declining population	57	52	-9	0.84	59	0.84	49
Increasing population	238	303	+27	0.89	63	1.11	66

¹ Percent of overall U.S. rates.

increasing difficulties of Wyoming students in obtaining admission to medical schools and the low rates of return to the State of those who became physicians, and (c) a promising fiscal climate in the State, with large current and even larger future surpluses owing to revenue from a mineral severance tax.

The geography and population distribution of Wyoming clearly preclude the development of a traditional medical school. No population concentration exists that is adequate to support a university teaching hospital or the usual accompanying subspecialty clinical and biomedical research base. However, Wyoming does have the opportunity to develop a medical education system that could provide direct support for the State's health care system. The education system could be effected by building it around a core of rural family practice, health team development, and the use of modern educational technology not only to support the teaching of medical students and family practice residents but also as a major provider of continuing education for practicing health professionals and for students in the nonphysician health professions. Thus, the statewide community itself could replace the teaching hospital as the major substrate for teaching, research, and service. Such a statewide system is not only more appropriate for the health care needs of Wyoming than a teaching hospital, but it also can better motivate, make competent, and retain young health professionals for service in the State.

A program was proposed that included the following elements:

1. Undergraduate medical education that would provide basic science courses at the University of Wyoming and clinical experience divided between (a) community hospitals and model practice settings in multiple locations within the State and (b) approximately one-quarter of the clinical clerkship time to be spent in a traditional university hospital in a nearby State. During the clinical training within Wyoming, emphasis would be on primary care and family practice in the rural and small-town environment. No new or separate university teaching hospital would be built.

2. Family practice residency training would be developed in the community hospitals and the model practice settings.

3. Interdisciplinary health team training would include—in addition to medical students and family practice residents—nursing students, physician's assistants, and graduate training of nurse practitioners.

4. Continuing education and technical support would be provided for the State's practicing health professionals.

5. Medical (and other health professional) education would be fused with, rather than isolated from, the health care system of the surrounding community. If viewed in this light, the low density of population and the relative lack of existing health care institutions become advantages, rather than handicaps, for structuring a new educational program. Moreover, the most appropriate way for educational institutions to assist communities to solve their health problems is to be, in both structure and curriculum, responsive to the context of the surrounding community.

It is yet too early to describe the outcome of these proposals. Doubts have been and continue to be raised, especially by physicians, as to whether such a system could attain "quality" (although it is difficult to define objective standards of quality of physician education and practice).

In the spring of 1975, the Wyoming State Legislature appropriated the necessary funds for the development of the family practice residency portion of the program and for contractual relationships for undergraduate medical education with nearby States. However, it left unresolved the question of a team approach to health services education (physician and nonphysician) within the State and of the development of a statewide educational system for health professionals (14).

Central Africa

Despite the major differences between Wyoming and Central Africa in patterns of health and illness and in

availability of resources within and outside the health care system, the new University Center for the Health Sciences (UCHS) in Yaoundé, Cameroon, is based on many of the same concepts described in the preceding section (15). The goal of UCHS is to train physicians and other health workers to meet the health care needs of Cameroon, a country with health problems characteristic of most developing African nations. The following 1970 estimated figures for Cameroon were obtained from the United Nations' Demographic and Statistical Yearbooks and the Third Five-Year Plan of the Republic of Cameroon. (Because of the large local variations among regions of the country, as well as a lack of accurate data, the figures are approximations.)

<i>Republic of Cameroon</i>	<i>1970 estimates</i>
Land area, square miles	184,000
Population, millions	6
Population density, persons per square mile ..	31
Percent annual rate of population growth	2.0
Percent population aged 0-14 years	41
Percent population in towns larger than 20,000.	7
Annual per capita GNP (U.S. dollars)	200
Life expectancy at birth, years	35
Annual crude death rate	23
Infant mortality rate	137
Death rate of children aged 0-4 years	265
Population per physician	26,000
Population per diploma nurse	10,000
Population per hospital bed	3,000
Per capita government health expenditures (U.S. dollars)	2.20
Health budget, as percentage of all government budget	7.5

As part of the plans of the UCHS for a major educational emphasis on community-based training for its students, a group of UCHS faculty members, including public health, pediatrics, and public health nursing teachers, proposed the following program and gained approval for its implementation in the academic year 1972-73.

Teams of 5 or 6 students would spend 8 weeks living and working in small villages, using the local health center as an operating base. Each team consisted of 2 fourth-year medical students (the medical course lasts 6 years), 2 second-year undergraduate nursing students, and 1 or 2 advanced post-degree nursing students. The following three major objectives were discussed with the students during their orientation before going into the field: (a) to gain a basic understanding of rural health problems in Cameroon and of the role and potential of the rural health center in meeting these needs, (b) to experience functioning as a team of persons of various disciplines in both clinical and public health settings, and (c) to attempt an analysis—based on a written report produced by each team—of the ecology of a community health problem in its various aspects ranging from individual clinical presentation, epidemiology in the surrounding community, and societal impact.

The site selected for the program is a grassland district some 250 miles from the capital city of Yaoundé—10 hours by car and linked by telephone but without plane or rail transportation to Yaoundé. Despite its geographic remoteness from the “mother campus,” the area was chosen because of its relatively well-functioning regional system of rural health centers. The centers are dispersed around Bamenda, a central town of 8,000–10,000 population. The district office of preventive medicine (responsible for the supervision of the health centers) and the district hospital are located in the town. Several rural health centers within a radius of 20 miles to Bamenda were selected as teaching sites. Each center serves 5,000–10,000 people, and each is staffed by a senior nurse or nurse midwife, or both, one or more nursing auxiliaries, a sanitary inspector, and a pharmacy auxiliary.

The teaching and supervisory support for the student teams was planned as a three-tiered network, as follows:

- The local health center staff, which serves one student team continuously during the 8-week program.
- The Bamenda-based UCHS faculty, which serves all student teams intermittently, 2 or 3 days a week.
- The Yaoundé-based faculty, from which rotating consultants serve all teams during 3 or 4 weeks of the 8-week clerkship.

First level. The existing health center nursing staff was to be available to the students around the clock. In retrospect, the project's inability to prepare these nurses adequately for their important role planted the seeds for serious problems in the program, especially because of the traditional hierarchical relationships between experienced nurses and “young doctors.”

Second level. The Bamenda-based UCHS faculty, a public health physician and a public health nurse, and the affiliated faculty, a preventive medicine physician and his physician deputy (available to the project half time) and a sociologist were to make day-long visits two or three times a week to each health center. In practice, however, poor travel conditions decreased the time for the visits to less than a full day; this also created a serious problem in adequate teaching and supervision of the students.

Third level. The Yaoundé faculty, public health physicians, pediatricians, general practice physicians, obstetrician-gynecologists, and nurses, theoretically were to make week-long visits to the rural zone so that during each 8-week period one of these faculty members would be onsite at least half time. In practice, however, this system did not function effectively because of transportation and logistical difficulties, conflicts with other teaching commitments, and the disinterest of some members in spending significant time “in the bush.”

In addition to the students' daily work in the health centers and surrounding communities, they attended teaching conferences held by local and visiting faculty

on Saturdays. Often these conferences were built around case presentations of common conditions seen in the health centers, such as malnutrition, anemia, diarrhea and dehydration, and management of high-risk pregnancies. Toward the end of the 8-week period, all the students would gather in the district's central town to present and discuss their team reports.

An adequate evaluation of the impact of this rural health experience on the knowledge, skills, and attitudes of students regarding rural health care is not yet available. Impressionistically, one can say that student responses to both the content and context of the experience was positive, and for many it provided an important experiential balance to the urban hospital setting. However, there were major difficulties and corresponding student dissatisfaction with the logistics of transportation from Yaoundé to the rural district and with the housing and living conditions in the villages. Perhaps these difficulties themselves were an important growth and learning experience in the realities of rural semi-isolated service; on the other hand, the hardships encountered may turn students away from later professional commitment to rural areas.

During their rural clerkships, medical and nursing students participated together in public health activities—mass measles vaccination campaigns, community health surveys, and environmental health activities such as inspection of water supplies and markets.

A dilemma that plagued the program during its first 2 years concerned the level of training and experience of the medical students on the teams. Although there was a desire to place this project in the curriculum as early as possible in the 6-year course of studies, there was also the question of the need for sufficient diagnostic and therapeutic sophistication required for the field conditions. To seek a balance, the UCHS administration postponed the program for the academic year 1974–75 and resumed it with fifth-year medical students in 1975–76. However, with this postponement of a rural health experience until late in the course of medical studies, the UCHS risks falling into the trap of too little and too late exposure that frequently has beset programs in social and community medicine around the world. It is hoped that the leadership in Yaoundé will be able to steer a wise course between the poles of too early an experience, when students are inadequately prepared for the extent of independent functions required, and too late an experience, when students' attitudes have already crystallized into dependency on the urban teaching hospital.

Conclusion

The two activities described cut across the spectrum of medical education as it relates to rural primary care and development of health teams. The Wyoming proposal concerns the outlines of the development of a new institution specifically designed to confront these issues. The Yaoundé experience demonstrates at an operational level

the type of teaching project that must fit within an institutional context.

Neither activity can be labeled a success at present; the life expectancy of both is uncertain. Possibly, both efforts will be redesigned into more traditional models of medical education. Although Wyoming and Yaoundé are located in extremely different cultural, geographic, and medical environments, they experienced a striking similarity in traditional pressures and hesitations in their attempts to depart from the educational status quo. Perhaps the need to overcome traditional obstacles is the major message of interest to those who, in whatever location, seek necessary changes in medical education systems to achieve a more equitable distribution of health services in rural areas.

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